

Establishing a Response Time Policy for Bedford County Fire and Rescue

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CERTIFICATION STATEMENT

I hereby certify that this paper constitutes my own product, that where the language of others is set forth, quotation marks so indicate, and that appropriate credit is given where I have used the language, ideas, expressions, or writings of another.

Signed: _____

Abstract

Bedford County Department of Fire and Rescue (BCoFR) did not have an established standard or policy for response times. The purpose of this applied research project (ARP) was to identify acceptable standards, evaluate current response times, compare response data to acceptable standards and identify information used to establish an acceptable response time policy for the emergency response agencies within Bedford County.

The research method utilized was descriptive. The research questions were: a) What national guidelines and requirements exist for emergency response time standards? b) What do other like size combination departments use as an emergency response time standard? c) What are the current response times in BCoFR?

Applied Research began by obtaining information from the NFA LRC through a data search for “establishing a response time standard”. Ten local like size departments were contacted and questioned to determine if they had established standards for response times.

Research showed that Bedford County’s average response times were below the recommended national benchmark; only three of the ten local departments had implemented a standard. NFPA standards 1710, 1720, and 1221 were reviewed as a benchmark and national standard. Improvements in response time average were needed in order to meet the established standards as well as NFPA 1720 standard.

Through the research, it was the recommendation of the researcher that Bedford County Department of Fire and Rescue adopt the NFPA 1720 standard and to establish a process to track data on average response times, to insure benchmarks were met. It was also recommended to annually evaluate the data for average response times to determine if any operational or administrative policies or practices could improve the average response time.

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Establishing a Response Time Policy for Bedford County Fire and Rescue

Emergency response times are very important in the mitigation of an emergency incident. When individual citizens call 911 for an emergency they have an expectation of a timely response to their call for help. For a volunteer cadre of firefighters there are many factors that affect the response to an emergency incident. A prompt and timely response can be very important in the survival of a victim, extent of damage to a structure as result of fire, or the amount of chaos that could ensue during a disaster. Establishing a benchmark for an acceptable response time will assist Bedford County Department of Fire and Rescue in the continual improvement of the services provided to the community.

The problem is Bedford County Department of Fire and Rescue (BCoFR) does not have an established written response time policy or standard, which leads to a wide range of response times to emergency incidents.

The purpose of this research is to identify information used to establish a response time policy for emergency responses in Bedford County. The descriptive research method will be used to answer the following research questions: a) What national guidelines and requirements exist for emergency response time standards? b) What do other like size combination departments use as an emergency response standard? c) What are the current response times for fire department responses within Bedford County Department of Fire and Rescue?

Background and Significance

Bedford County is a mostly rural community that covers 753 square miles in southwest Virginia. Bedford County Department of Fire and Rescue is a combination department that has approximately 750 dedicated volunteers and 35 career staff serving the citizens and visitors of

Bedford County in a wide-range of emergency services. ("Bedford County Department of Fire and Rescue welcome page," 2011, para. 1). The volunteer cadre is composed of twelve volunteer fire companies and twelve rescue agencies under the umbrella of Bedford County Department of Fire and Rescue. In Bedford County volunteers typically respond from their homes to the scene or station upon receipt of an emergency call. They are dispatched from a centralized Enhanced 911 center via 800 mhz radios and pagers. Occasionally crews will be in their station and personnel will be at the ready to respond to an incident, while on duty career staff personnel are required to stay in their first due area during their shifts. Within Bedford County all career staff personnel are cross trained firefighters and emergency medical services responders, staffing ambulances during their shifts. All emergency response personnel both volunteer and career are notified of an emergency incident through issued radios and pagers. Once volunteers receive a notification of an emergency they report to the fire station and then respond to the emergency incident in fire suppression apparatus. This current operation causes a response delay to the emergency incident. There are no documented policies, requirements or system expectations as it relates to response times within the Bedford County Department of Fire and Rescue system. Bedford County Department of Fire and Rescue (BCoFR) has instituted such programs as a tanker task force, rapid intervention team (RIT) dedicated response departments, multiple company fire response and streamlining communication systems, all programs aimed at reducing delays in emergency response. These are illustrations of proactive solutions Bedford County has taken to improve the overall emergency service to the citizens and visitors with these improvements.

While the lack of system emergency response standards may be a problem that still exist in Bedford County Department of Fire and Rescue. There are no current standard to measure the

level or adequacy of our emergency responses to the citizens and visitors within Bedford County. Once there is an established response standard the Bedford County Department of Fire and Rescue will be able to measure operational conditions against the standard.

There has not been an initiative to date to evaluate the current response times of emergency response within the county or efforts made to improve times, nor to develop a response time standard. This ARP will relate to topics learned in Executive Development, including being an agent of change, proving the validity of the (APIE) structural change model. Further this project also relates to USFA operational objective to respond appropriately in a timely manner to emerging issues, and further develop the researcher's knowledge of executive decision making.

Literature Review

The literature review was focused on evaluating the components that make up a fire response time standard. Bedford County Department of Fire and Rescue is a combination fire and rescue system; however the extent of this research will focus on fire department response times. Information derived from this research will be used to establish a fire response time standard that can be adopted by Bedford County Department of Fire and Rescue.

Research began by asking: a) What national guidelines and requirements exist for emergency response time standards? The researcher needed to identify what components fire response time standards include. The time in which the fire ignites until the time the fire is extinguished is known as a total response time. The national standards under National Fire Protection Association (NFPA) for response time are dependent upon the type of department career or volunteer being evaluated. The career department response standard, NFPA 1710, has a

well established firm timetable and is easy to follow (National Fire Protection Association 1710, 2010). However, the standard that addresses combination and volunteer departments is less specific with recommendations, and is open ended(National Fire Protection Association1710, 2010). NFPA 1710 specifies a recommended turn out time and response time, while NFPA 1720 is more confusing and the lack of specifics makes this more difficult to establish a definite recommendation.

The definition of response time is dependent upon which perspective it is viewed from. A citizen may view the response beginning when their need for help is realized. The fire responder may view the response time beginning when they are notified of the emergency. The true reality of the response time should begin at the time of the ignition of the fire. Of course the end of the response time will be at the point of extinguishment. In between these two times there are many components that are involved, they include but are not limited to, the recognition of an emergency, notification of the emergency (i.e. 911 call, dispatching the appropriate resources), reaction or turnout time, response time/drive time, set-up time, and extinguishment (United States Fire Administration, 2006). All of these components are very important and should be considered in the establishment of a response time standard. As related to response times different calls for service may require a different level and speed of response (Goldfeder, 2006). Other standards related directly to the establishment of response times, NFPA 1221 states the dispatch notification time should be one minute 95% of the time ("NFPA 1221," 2002). The dispatch notification time is defined as: "A time by which an alarm received at the communications center is retransmitted to emergency response facilities (ERFs) or to emergency response units in the field" ("NFPA 1221," 2002). Times are displayed in a report that show the fire department performance measures that should be used as a guideline, compares NFPA 1710

and 1720 with the NFPA 1221 standard and depicts a flow chart as incident development and response timeline recommendations. The report also depicts different recommendations based on the 1710 and 1720 standards that have been established. For instance the NFPA 1221, does not differentiate between a career, volunteer or combination fire department responses, however does show differences between the turnout time and the responder response time. NFPA 1710 standard states that responders should arrive within four minutes of turn out time, where the NFPA 1720 standard for time varies based on the amount of population that is being protected in a square mile area. The standard shows the larger the population protected the more responders needed and the shorter the time for emergency response (Flynn, 2009).

The 2010 census information shows that Bedford County's population was 68,676 with the average population per square mile as 91.2. That would equate to utilizing the rural area demand zone in the NFPA 1720 staffing and response time table 4.3.2. (NFPA, 2010)

The next question addressed for this research is: b) What do other like size combination departments use as an emergency response standard? Contacting other local like sized and combination departments in the Division 6 Virginia Department of Fire Programs service area; the researcher asked the following question: "Do you in your locality have an established response time standard or benchmark?" The common answer the researcher received was that most agencies have considered establishing a response time standard but do not currently have an established standard or benchmark (J. Ferguson, D. Campbell, G. Roakes, & R. Forseman, personal communication, February 13, 2012). The researcher did receive responses from three local combination departments that have established a standard for use within their organizations. Franklin County a bordering jurisdiction to the south has a benchmark of ten minute average response time or less 85% of the time outside of village centers. Village centers

are defined in Franklin County as the most densely populated areas of the county. They also have a benchmark for designated population centers within their county of eight minutes or less 90% of the time (Franklin County Public Safety, 2005). Campbell County Public Safety a bordering jurisdiction to the east has newly established service level objectives which are based from the NFPA 1720 standard. Their service level objectives for responses to all structure fire responses are fourteen minutes, 80% of the time. They have also added into the objectives a minimum staffing requirement to meet that response objective (R. Johnson, personal communication, February 13, 2012). Henry County Public Safety to the south east of Bedford County also established a response time benchmark, in the early 90's which established a ten minute response time 90% of the time. Chief Tatum stated they have yet to meet that benchmark totally (M. Tatum, personal communication, February 13, 2012). The research determined that only a 30% of the localities questioned have established a response standard, in which Bedford County could evaluate when moving forward in establishing a response standard.

Before agencies are able to establish a standard the agency should determine what current response times are and determine if improvements are needed to better serve the end user. Bedford County has an Enhanced-911 center that receives and dispatches all of Bedford County/ City calls for service. They dispatch for the twenty-four fire and rescue agencies, the Bedford County Communications Center also answers calls for the Sheriff's Department, City Police, city and county public works, and city and county school system. In 2011 current average response time for volunteer fire departments within Bedford County was 14.06 minutes from dispatch receipt to units marking enroute. The average response time from dispatch to arriving on scene was 21.48 minutes (Mowles, S., 2012).

The literature has shown that establishing a response time standard will allow agencies to measuring how quickly the fire departments are responding to incidents. There are national standards that recommend response time benchmarks however; the standards differ for departments that are 100% career versus those of a combination and/or volunteer department.

The literature has shown that there are many factors that make up a true and accurate response time and have previously been discussed. The researcher found that the accuracy of response times can be questionable and is only as reliable as the person entering the information (T. S. Bush, personal communication, February 14, 2012). Research also showed that of the local combination departments that have established a response time standard, it has been difficult for departments to actually live up to the standard they establish for their agencies.

Procedures

Bedford County Department of Fire and Rescue is a volunteer department with career staff supplement. It is becoming apparent that the response times of fire departments to fire incidents needs to be evaluated and a response time standard established to better serve the needs of Bedford County. The descriptive method was utilized to evaluate the standards that exist as it relates to response times and use those to recommend establishing a response time standard in which all fire agencies under the umbrella of Bedford County Department of Fire and Rescue should follow.

The procedures used in this research were utilized to determine what current fire department response times existed and to establish a standard to use as a benchmark for improving the overall response times to emergency incidents. Comparisons of response times to meet the national standard were needed to evaluate current conditions and to determine ways to continue to improve the service to the citizens and visitors of Bedford County.

The first research question is a) “What National Guidelines and/or requirements exist for emergency response time standards?” The three standards the researcher utilized are NFPA 1710, 1720, and 1221. The NFPA 1710 is a career department standard which has a benchmark for the entire response time. NFPA 1710 4.1.2.1 established the response time objectives. The standard states the alarm processing time should be no more than 90 seconds 99% of the time, while turnout time should be no more than 80 seconds for fire responses. The first arriving engine should have no more than a 240 second travel time or 480 second for the deployment of an initial full alarm assignment. It is also understood and needs to be highlighted that those response time objectives are for a career fire department and not for a volunteer or combination fire department such as Bedford County. However, it is important to evaluate the standard as well as to understand each component that makes up a response time, equally important to note, the NFPA 1710 standard does not incorporate any reaction time prior to the Public Safety Answering Point (PSAP) receiving the report of the incident.

NFPA 1720: Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments, is the combination and volunteer department standard. This standard does not establish a turnout time requirement, until the department has the required number of personnel on the scene; this number is based on the population and square miles of the area in which the fire response is located. Bedford County being a 753 square mile county and having both urban and rural identified response areas makes it difficult to establish one standard for all twelve fire departments based on the NFPA 1720 standard. In 2010 the census published Bedford County's population at 68,676 with the average population of 91.2 persons per square mile, according to NFPA 1720, the majority of Bedford County would fall in the rural area demand zone. Bedford

County also has areas that fall into remote area demand zone according to NFPA definition, due to the travel distance being greater than 8 miles from fire station. For the sake of consistency, the rural area demand zone recommendation will be used in establishing a standard for Bedford County Department of Fire and Rescue.

The NFPA 1221 standard addresses communications through Public Safety Answering Point (PSAP) for the reaction time, receiving a call until dispatching the appropriate resources. This standard has two parts for a primary PSAP, first, is the call answering and the second, is the call processing. The call answering standard is 95% of the alarms are to be answered within 15 seconds, while 99% of calls need to be answered within 40 seconds. The processing time standard is for 90% of calls being processed and dispatched within 60 seconds, while 99% of the calls being processed and dispatched within 90 seconds, with the current communications center utilizing flip cards versus computer aid dispatch. Their time frame benchmarks leave very little time for the dispatcher to determine what resources are appropriate to notify and even less time to have the resources dispatched within the benchmark.

The second question is: b)“What do other like size combination departments utilize as an emergency response time standard or benchmark?” The researcher asked ten local combination fire departments “If they had an established response time standard or benchmark?” The researcher received seven out of ten responses and only three had an established response time standard. The three departments that had an established benchmark ranged from an 8-14 minute response standards at least 80% of the time on fire responses. As was shown in the literature review, of the three departments that have a benchmark established, some have not met those benchmarks. However, those departments do provide a local example for Bedford County to reference as guides when establishing a standard in addition to the national standard.

The third question is: c) “What are the current response times in Bedford County?” The researcher was given access into the PSAP reporting system and was able to search by fire department to retrieve reports of each department’s response times for the 2011 calendar year. The average response time for all twelve fire departments was 14.06 minutes from the time of dispatch to the time apparatus/personnel were enroute to the emergency scene. The average time for all twelve departments was 21.48 minutes from time of dispatch until the first arriving unit on scene. The department with the lowest average time is 8.25 minutes until enroute and 14.16 minutes until on scene. The department with the highest average time is 17.18 minutes to enroute time and a 29.40 minute to on scene time. There is a varying degree of response times within our large and diverse county.

The average 2011 response times in Bedford County show they are not meeting the recommended response time established by the NFPA 1720 standard. The evaluation of each component of the response time is imperative in establishing the response time benchmark. To explain the different components of a response time an evaluation of the NFPA 1710 standard is reviewed. The total response time is the time interval from the receipt of the alarm at a PSAP until the first unit is providing some intervention on the scene of an emergency. That time has multiple components that need to be explained. Turnout time begins from the time PSAP notifies the emergency response units until the time when response or travel time begins. Travel time is defined as beginning at the end of the turnout time until arrival of units on the emergency scene. Intervention time begins upon arrival of emergency scene until the time of the initiation of emergency mitigation. Those are the components of the total response time as defined by NFPA 1221 (NFPA, 2010). NFPA 1720 response time begins upon completion of the dispatch notification and ends with the emergency mitigated to a total response time of fourteen minutes

(NFPA, 2010, figure 4.3.2). The rural area demand zone was chosen from (U.S. Census Bureau, 2010) that stated average population per square mile was 91.2.

The limitations of the research included seeking information from like size combination departments the limitation was evident when only three of the localities within the Virginia Department of Fire Programs Division 6 region had an established response time standard or benchmark. The limitation shows that in the local area that like size departments have yet to identify the importance of documenting and having an established response time standard, which will result in improved service delivery for the end user.

Another limitation of the research was the accuracy of the current response time data from the PSAP information that was obtained to determine the current response times. This is a limitation because there is no proven accuracy of the information obtained due to the potential for errors in the entering of the data into the system by the telecommunicator.

This research has been the first of its kind performed within the Bedford County Department of Fire and Rescue system and the data sets that were obtained had no historical comparisons to determine if the current response times have improved over the years. Only data for the 2011 response time information that was obtained for the purposes of establishing what the current response times are.

This research was only related to fire responses and did not take Emergency Medical Service (EMS) agency responses into account for the purposes of this research. The reason that these times were not evaluated is due to the addition of career personnel assigned to ambulances which has significantly decreased in EMS response times and is continually tracked.

The results of this research shows that Bedford County Department of Fire and Rescue would be benefited by implementing a standard response time standard as well as continue to

evaluate the response times on an annual basis to determine what policies and operational improvements could affect the overall response times, to better service the community and those in need of emergency services.

Results

The results of this research helped to identify information that is needed in order to establish a response time standard. The following questions were answered within the research and the following results were compiled to formulate a recommendation to Bedford County in establishing a response time standard. The first research question is: a) “What national guidelines and/or requirements exist for emergency response time standards?” The three standards the researcher utilized were NFPA 1710, 1720, and 1221. The NFPA 1710 standard shows all of the components that make up a total response time. The total response time is the time at which the emergency is realized and 911 call is placed to the PSAP. The processing time, the reaction time, the travel time, and the time the incident is mitigated. The standard was established for career departments but shows clearly all of the components of a total response time. The NFPA 1720 standard establishes the response times for combination and volunteer departments. It does not incorporate the reaction time of a department into the standard. This standard however does make recommendations based on the population of a demand zone, the amount of people needed and response time desired for each demand zone. The demand zones are divided up into 5 areas, urban, suburban, rural, remote, and special risks. The standard establishes the demographics in the urban area is greater than 1000 people/sq. mile. The suburban area is between 500-1,000 people/sq. mile. The rural area is less than 500 people/sq. mile. The remote area is based on a travel distance of equal to or greater than eight miles. The special risks criteria are determined by agency having jurisdiction. Bedford County is mostly categorized in the rural area and in some

areas the remote demand zone. The NFPA 1720 standard also recommends a response time in minutes for each of those response areas. The rural demand area recommends a fourteen minute response time. NFPA 1221 standard establishes the processing time recommendation the PSAP should utilize as a standard. It establishes the alarm handling and dispatch time, which should take one minute 95% of the time. The second question is: b) “What do other like size combination departments utilize as an emergency response time standard or benchmark?” The ten fire departments that were asked if they had an established response time standard, only three had an established recommendation. The three that had an existing standard, utilizing a response time expectation of ten minutes 80% of the time. The other department uses a response time expectation of fourteen minutes 80% of the time within eight miles of fire station. The third standard follows the NFPA 1720 standard and follows the rural demand zone for their standard. The other two fire departments established the ten minute expectation with little statistical data. These departments use times as a benchmark to reach instead of utilizing them as a standard to adhere to. The Third question is: c) “What are the current response times in Bedford County?” The current response times for the twelve volunteer fire departments in Bedford County is detailed in appendix A. In Bedford County there are twelve fire departments that make up Bedford County Department of Fire and Rescue. One department is located in an urban area but covers rural area territory as well. One of the fire departments is a totally marine fire department. They respond to incidents on the lake located on the south side of Bedford County. That department is asterisked in the appendix to differentiate between the land and marine based fire departments. However, it is tracked with the other land based departments in the response time analysis. The average reaction time and response time were researched for 2011 calendar year.

The number of responses to make up the average reaction and response time were also incorporated into the research. It is placed in the appendix to show activity of the departments.

Discussion

The researcher established what the national standard were as it related to the emergency fire response times. The NFPA 1710, 1720 and 1221 standard were all reviewed. The NFPA 1710 standard for career departments was relevant to this research to evaluate the different components that comprise a response time as defined by NFPA. (NFPA, 2010) That same definition is carried out consistently throughout the NFPA standards as it relates to response time standards. There is also literature from the US Fire Administration that establishes the components of the response times, showing the consistency in the components of the response times. (United States Fire Administration, 2006) The NFPA 1720 standard establishes response time recommendations for volunteer and combination departments as it relates to the response time standard, there is a chart within NFPA 1720 that identifies recommendations for response times which are dependent upon the population per square mile and if the travel time is greater than eight minutes.(NFPA, 2010, figure 4.3.2) NFPA standard 1221 is relevant in the communications center dispatching standard of less than 60 seconds.("NFPA 1221," 2002) This standard is not the primary focus of this research but it is an important component of the overall total response time and should be noted as such.

The researcher found that the twelve Bedford County Fire Departments response times are greater than that of the established NFPA 1720 standard that recommends response times benchmarks for volunteer and combination departments. The 2011 average response times are 21.48 minutes, which is well above the fourteen minute recommendation established by that of NFPA 1720, with reaction time to be fourteen minutes, which is a seven minute difference

between the Bedford County average reaction time and response times. This shows the average travel time in Bedford County to be seven minutes. The research shows there needs to be significant improvement in the reaction time portion of the total response time, two variables that could be improved by a standard being established. Research clearly shows the travel time is less of a concern than that of the reaction time by the fire departments. If the reaction time is reduced by the fire departments then there could potentially be great improvement in the total response time, therefore allowing for a corresponding improvement in the level of service delivered by the fire departments.

Recommendations

Through the research conducted within this Applied Research Project(ARP). It is the researcher's recommendation to perform an annual review of the average response times and continue to document trends in establishing a response time standard. Based on the research of Bedford County Department of Fire and Rescue's fire department response times, it is recommended that Bedford County Department of Fire and Rescue comply with the recommended response time benchmark already established within NFPA 1720. The researcher recommends the benchmark be derived from that of the rural response district within the NFPA 1720 standard of a fourteen minute average response time county wide. It is the thoughts of the researcher that Bedford County citizens and visitors will benefit from the establishment of a response time benchmark which is of fourteen minutes in accordance with NFPA 1720 standard, which will improve the level of service to the citizens and visitors of Bedford County.

These recommended changes should be evaluated by Bedford County Department of Fire and Rescue and the recommendation should be incorporated into the goals of the organization. This will establish the improvement of response times as a priority within the department and

increase the importance to all twelve fire departments in meeting the citizen needs. Establishing a response time standard will require the support and cooperation from the Volunteer Fire Commission in order for it to be successfully implemented. The researcher believes it is appropriate to incorporate an annual evaluation of this standard and all improvements in the system to determine if any policy changes or operational changes could take place to further improve the response times in a positive or to determine if any changes have affected response times in a negative manner.

In conclusion, it is the researcher's recommendations that any future research efforts to improve response times within a locality, should study the response time trends over a longer period of time than what was done in this ARP. The reason it was not done in this ARP was due to the fact that an evaluative research method was used to evaluate the current status of the organization. It is recommended that further research be accomplished in order to select a larger sample of like size departments than was possible within the scope of this Applied Research Project. The researcher also recommends evaluation the components that may be amended or updated to improve the response times and potential impact on the community.

References

- Flynn, J. D. (2009). *Fire service performance measures*. Retrieved from National Fire Protection Association website: <http://www.nfpa.org/assets/files/pdf/os.fsperformancemeasures.pdf>
- Franklin County Public Safety. (2005). *Strategic Plan*. Retrieved from Franklin County Government: <http://www.franklincountyva.gov/public-safety/downloads/ps-strategic-plan>
- Goldfeder, B. (2006, June). Real response times [article]. *Fire Rescue Magazine*, 120,122.
- Main page. (2011). Retrieved from <http://www.bcofr.com/index.html>
- Mowles, S. (2012). VisionAir CAD [dispatch software]. Unpublished instrument. Bedford, Virginia: VisionAir CAD.
- National Fire Protection Association. (2002). In *Standard for the installation, maintenance, and use of emergency services communications systems* (pp. 14-16). Quincy, MA: NFPA.
- National Fire Protection Association. (2010). NFPA 1710. In *Standard for the organization and deployment of fire suppression operations, emergency medical operations, and special operations to the public by career fire departments* (Reference Manual). Quincy, MA: NFPA.
- National Fire Protection Association. (2010). NFPA 1720. In *Standard for the organization and deployment of fire suppression operations, emergency medical operations, and special operations to the public by volunteer fire departments*. Quincy, MA: NFPA.
- U.S. Census Bureau. (2010). *State and County Quick Facts*. Retrieved from U.S. Census Bureau : <http://quickfacts.census.gov/qfd/states/51/51019.html>
- United States Fire Administration. (2006). *Structure fire response times*. Emmitsburg, MD: United States Fire Administration.

Appendix A

Bedford County Fire and Rescue

2011 Average Reaction/ Response Times

Department	Reaction	Response	# of Calls
Company 1	8.25	14.16	1787
Company 2	14.50	21.45	296
Company 3	12.44	19.01	240
Company 5	12.10	15.59	1063
Company 7	15.40	24.13	2286
Company 8	12.28	20.08	1011
Company 9	14.24	18.42	356
Company 10	17.14	26.53	161
*Company 11	17.18	29.40	571
Company 12	16.36	26.26	178
Company 13	13.30	19.49	735
Company 19	15.55	23.24	118
Total Averages	14.06	21.48	567

*All Marine Fire Company contains no land based apparatus